Abstract of the disclosure

Silicon dioxide (SiO_2) films are deposited at room temperature using a chemical vapor deposition (CVD) reaction catalyzed by ammonia or a Lewis base. The SiO_2 film growth is accomplished through the reaction of water and certain silicon precursors. Examples of these reactions include the $SiCl_4 + 2H_2O \rightarrow SiO_2 + 4HCl$ or $Si(OR)_4 + 2H_2O \rightarrow SiO_2 + 4ROH$ reactions and catalyzed with ammonia (NH_3) or other Lewis bases. The NH_3 catalyst lowered the required temperature for SiO_2 CVD from > 900 K to 313-333 K and reduced the $SiCl_4$ and H_2O pressures required for efficient SiO_2 CVD from several Torr to <500 mTorr.